Special Populations, Comorbidities, and Preferred Agents [a,b]

	Preferred Agents	Alternate Agents	Other Selected Agents	Comments
Uncomplicated	thiazide, diuretic, β-blocker	ACEI, CCB	α-blocker, clonidine, reserpine	Short-acting nifedipine should not be used for long-term management of HTN
African-American Race	thiazide diuretic	CCB, β-blocker, ACEI	α-β-blocker, clonidine, α-blocker	Differences in efficacy among patient populations are not as apparent when diuretics are added to ACEIs and β-blockers[d]
Asthma / COPD	thiazide diuretic	ACEI, CCB	clonidine, α-blocker	β-blockers generally contraindicated in patients with bronchospastic disease
BPH-Symptomatic	α-*blocker*[c]	β-blocker, ACEI, thiazide diuretic (low dose), CCB	clonidine	Diuretics may influence symptoms of polyuria and frequency
Coronary artery disease	β-***blocker*** (non-ISApost-MI)	*verapamil*, *diltiazem*	DHP SR, ACEI, thiazide diuretic	Non-ISA β-blockers are the drugs of choice post-MI; ACEIs are also indicated post-MI in patients with systolic dysfunction
LVD-Diastolic	β-blocker, diuretic	verapamil, diltiazem	ACEI, α-blocker	Diuretics should be used if symptoms of volume overload exist
LVD-Systolic	**ACEI**[d]**, diuretic**[d]	angiotensin II antagonist, hydralazine/nitrates	amlodipine, felodipine	ACEIs are preferred for their potential improvement in morbidity and mortality in this patient population; diuretics should be used if symptoms of volume overload exist; angiotensin II antagonists may be used where an ACEI is not tolerated; other selected agents may be used in conjunction with an ACEI in stable CHF patients; β-blockers[d] and CCBs should be used with caution
CRI (CrCl<25 ml / min or S_{cr} >2.5mg / dL)	furosemide, ACEI	β-blocker, CCB, α-blocker, indapamide, metolazone	clonidine, minoxidil, hydralazine	Potassium (K^+)-sparing diuretics, K^+ supplements, >3.0 mg/dL; metoprolol is the preferred β-blocker and/or ACEI may cause ↑K^+; use ACEI with caution in patients with S_{cr} due to hepatic excretion
Depression	thiazide diuretic	ACEI, CCB, α-blocker		Clonidine, reserpine, methyldopa, β-blockers may exacerbate depression
DM	***ACEI***[e] (types1 & 2 DM with proteinuria)	*thiazide diuretic* (low dose), CCB, β-blocker, α-blocker	angiotensin II antagonist	High-dose thiazide diuretics and β-blockers may worsen glucose control; β-blockers may mask hypoglycemia; use of DHP SR in patients with HTN and type 2 DM remains controversial
Elderly (>65yrs)	thiazide diuretic	β-blocker, CCB, ACEI	α-blocker	Use caution with α-blockers in elderly due to first-dose syncope or dizziness
Gout	β-blocker	ACEI, CCB, thiazide diuretic (low dose)	α-blocker	Diuretic-induced hyperuricemia does not require treatment in the absence of gout or kidney stones
Dyslipidemia	thiazide diuretic (low dose), β-blocker	ACEI, CCB, α-*blocker*		Thiazide diuretics may ↑TC and ↑TG and non-ISA β-blockers may ↓HDL and ↑TG, although these effects may be transient
Isolated systolic hypertension	**thiazide diuretic**	DHP SR, β-blocker, ACEI	α-blocker	The use of DHP SR as first-line therapy remains controversial, although studies are available to indicate benefit
Left ventricular hypertrophy	ACEI, thiazide diuretic, β-blocker	CCB	α-blocker, clonidine	Direct-acting vasodilators do not reduce left ventricular hypertrophy
Peripheral vascular disease	thiazide diuretic, ACEI	CCB, β-blocker	α-blocker	Nonselective β-blockers without α-blockade may worsen resting ischemia or severe claudication symptoms
Pilots	thiazide diuretic, lisinopril			
Pregnancy (chronic HTN)	methyldopa	labetalol	hydralazine (generally used for preeclampsia)	Except for ACEI and angiotensin II antagonists that are contraindicated during pregnancy, any antihypertensive drug may be continued if taken prior to pregnancy; β-blockers may cause growth retardation in 1st trimester

a Adapted from JNC VI; **Bold**=compelling indication per outcome data (unless contraindicated); *Italics*=may have favorable effect on comorbid conditions

b ACEI=angiotensin-converting enzyme inhibitor; BUN=blood urea nitrogen; CCB=calcium channel blocker; DHPSR=long-acting dihydropyridine; COPD=chronic obstructive pulmonary disease; BPH=benign prostatic hyperplasia; ISA=intrinsic sympathomimetic activity; MI=myocardial infarction; LVD=left ventricular dysfunction; CHF=chronic heart failure; CRI=chronic renal insufficiency; DM=diabetes mellitus; TC=total cholesterol; TG=triglyceride; HDL=high-density-lipoprotein cholesterol

c Generally recommended for use as adjunct therapy to other antihypertensive agents

d There is compelling evidence to use β-blockers as adjunct therapy in patients with NYHAII to III CHF who are stable on an ACEI with or without a diuretic; refer to PBM-MAPThe Pharmacologic Management of Chronic Heart Failure at www.vapbm.org or http://vaww.pbm.med.va.gov

e Compelling indication in type 1 DM with proteinuria; preferred agent in types 1 and 2 DM with proteinuria

VHA/DoD DIAGNOSIS AND MANAGEMENT OF PATIENTS WITH HYPERTENSION IN THE PRIMARY CARE SETTING

Patient with HTN
(SBP ≥ 140 or DBP ≥ 90)
(Annotation E)

↓

Is SBP> 210 or DBP> 120? — Treat or refer immediately

↓

Perform history, physical exam, laboratory and other diagnostic procedures
(Annotations F, G, H)

↓

Is a secondary cause suspected? (Annotation I) — Continue evaluation and treatment as indicated. Manage secondary cause and/or consider referral to specialist.

↓

IF	
[ ] control adequate	Continue current treatment. Reinforce lifestyle modification. Follow-up at next regular visit. (Annotation O)
[ ] SBP 140-159 or DBP90-99	Initiate diet and lifestyle modification and patient education. Drug therapy if end organ damage or diabetes or if inadequate control. (Annotation K, L)
[ ] SBP 160-179 or DBP100-109	Drug therapy is preferred. Consider aggressive lifestyle modification alone in selected patients. (Annotation K, L, M)
[ ] SBP ≥ 180 or DBP ≥ 110	Initiate/Continue drug therapy. Prescribe diet and lifestyle modification. (Annotation K, L)

Recommendations for Follow-up Based on Initial Blood Pressure Measurements for Adults[a]

Systolic	Diastolic	Recommended Follow-up
< 130	< 85	Recheck in 2 years
130-139	85-89	Recheck in 1 year[b]
140-159	90-99	Confirm within 2 months[c]
160-179	100-109	Evaluate or refer to source of care within 1 month
> 180	> 100	Evaluate or refer to source of care immediately or within 1 week, depending on the clinical situation

[a]If systolic and diastolic categories are different, follow recommendations for shorter follow-up (e.g., 160/86 mm Hg should be evaluated or referred to source of care within 1 month).
[b]Modify the scheduling of follow-up according to reliable information about past blood pressure measurements, other cardiovascular risk factors, or target organ disease.
[c]Provide advice about lifestyle modifications.

General Principles for Pharmacologic Management:

- Emphasize adherence to the medication regimen.
- If control not achieved, continue once a day regimen by increasing drug dose as tolerated OR substituting another drug OR adding an agent from a different class.
- Multi-drug regimens should include a thiazide diuretic for synergy, unless contraindicated.
- If BP control is not achieved with three drugs in compliant patients, further evaluation or referral should be considered.

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VA: Access full guideline at
http://vaww.oqp.med.va.gov/

DoD: Access full guideline at
http://www.cs.amedd.army.mil/qmo

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Recommended Dosage for Selected Hypertension Drug Therapy (Adapted from PBM-MAP The Pharmacologic Management of HTN, Supplement to the VHA/DoD Clinical Practice Guideline on HTN)

Drug[a]	Dosage Range[d,e]	Comments
THIAZIDE DIURETICS		
Hydrochlorothiazide[b]	12.5-25 mg/day (max=50 mg/day)	Use HCTZ/Triamterene with caution with ACEI and other K+ retaining drugs or supplements
HCTZ/Triamterene[b]	25/37.5-50 mg/75 mg/day	
β-BLOCKERS		β-blockers are contraindicated in asthma patients
Noncardioselective		
Propranolol[b]	IR: 40-480 mg/day in divided doses SR: 80-160 mg/day	Discontinue with slow taper over 1 week
Cardioselective		
Atenolol[b]	25-100 mg/day (adjust dose in CRI)	As doses increase, cardioselectivity decreases
Metoprolol[b]	IR: 50-300 mg/day (once daily or divided doses)	
CCBs		
Verapamil IR[b]	120-360 mg/day (in 2-3 divided doses)	Verapamil is contraindicated in AV node dysfunction (2nd or 3rd degree heart block), systolic CHF and decreased LV function
Verapamil SR[c]	120-480 mg/day (once daily or 2 divided doses)	
Diltiazem IR[b]	90-360 mg/day (in 3-4 divided doses)	Diltiazem may decrease sinus rate and cause heart block
Diltiazem SR (Tiazac®[b])	120-540 mg/day	
Dihydropyridines		Monitor adverse effects (DHPs may cause ankle edema, dizziness, flushing, headache)
Felodipine	2.5-10 mg/day	Use CCBs with caution in patients with liver or renal dysfunction
Nifedipine SR (Adalat®CC[b])	30-120 mg/day (manufacturer max=90 mg/day)	
ACEIs		
Captopril[b]	25-150[f] mg/day (in 2-3 divided doses)	Avoid in 2nd and 3rd trimesters of pregnancy due to possible fetal and neonatal morbidity and death
Fosinopril	10-40 mg/day	Monitor K+ and renal function
Lisinopril[b]	5-40 mg/day	
α-BLOCKERS	max=20 mg/day	Initiate at low doses (1 mg) with 1st dose given at bedtime to avoid syncope
Prazosin[b]	1-15 mg/day (in 2-3 divided doses)	
Terazosin[b]	1-5 mg/day	
ANGIOTENSIN II ANTAGONIST		
Candesartan	8-32 mg/day (once daily or 2 divided doses)	Contraindicated in 2nd and 3rd trimesters of pregnancy due to potential for fetal and neonatal morbidity and death
Irbesartan	150-300 mg/day	
Losartan	25-100 mg/day (once daily or 2 divided doses)	
Telmisartan	20-80 mg/day	
Valsartan	80-320 mg/day	
CENTRALLY ACTING		
Clonidine Tablet[b]	0.1-0.8 mg/day (in 2-3 divided doses) (max can be up to 2.4 mg/day)	Taper dose to discontinue
Clonidine Patch	0.1-0.6 mg patch weekly	Clonidine patches are costly but may be useful in selected patients
Methyldopa	500 mg-3 g/day (in 2-4 divided doses)	
PERIPHERALLY ACTING		
Reserpine	0.05-0.25 mg/day	Monitor for sedation, nightmares, tremors, nasal congestion, activation of peptic ulcer
VASODILATING AGENTS		Should be used with a diuretic and β-blockers to reduce edema and reflex tachycardia
Minoxidil	5-40 mg/day (once daily or 2 divided doses) (max=100 mg/day)	Monitor for hypertrichosis, pericardial effusions with minoxidil
Hydralazine[b]	30-200 mg/day (in 2-3 divided doses)	Monitor for headache and SLE (dose-related) with hydralazine

[a]Partial list
[b]DoD BCF item; all BCF items are available through the DoD NMOP
[c]Calan® SR, Isoptin® SR, and generic equivalents are on the DoD BCF
[d]Once daily dosing unless specified otherwise
[e]IR=immediate release; SR=sustained release
[f]Patients should take 1 hour prior to food ingestion (empty stomach)